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The distribution of *Arelate limbellata* (Stål, 1854) (Hemiptera: Flatidae) in Chile

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Abstract. The range of *Arelate limbellata* (Stål, 1854) (Hemiptera: Fulgoroidea: Flatidae), the only species of the genus *Arelate* Stål, 1862, is addressed. This Chilean endemic is distributed from Fundo Talanquén in Valparaíso Region (latitude 32°27′ S) to Panguipulli, Puyumen in Los Ríos Region (latitude 39°40′ S). New data are presented on *A. limbellata*, the first contribution on this species' geographical distribution since the original description, which only records the country of origin.

Key words. Fulgoroidea; Monotypic; Faunistics; Endemic; Central Chile; South Central Chile

The Flatidae, comprising 300 genera and 1429 species (Bourgoin 2017), is the fourth most diverse family within the Fulgoroidea. In Chile, this family is represented only by 2 species, *Arelate limbellata* (Stål, 1854) and *Poekilloptera aurantiaca* Melichar, 1901, whose distribution has not been specified beyond the country of origin (Stål 1854, Melichar 1901). *Arelate limbellata* is the only species in the genus *Arelate* Stål, 1862. Since the original description by Stål (1854), this species was redescribed by Melichar (1901, 1923). Later, Medler (1993, 1994) reviewed type material, emended Melichar's description, and illustrated male genitalia. There are no publications on any aspects of its biology.

Specimens of *A. limbellata* were field collected throughout Chile. Voucher specimens were deposited in the following collections: Museo Entomológico, Facultad de Ciencias Agronómicas, Universidad de Chile, Santiago, Chile (MEUC); Museo Nacional de Historia Natural, Santiago, Chile (MNNC), Juan F. Campodonico personal collection, Santiago, Chile (JFCW); and Richard Honour personal collection, Santiago, Chile (CPRH). Stål (1854), Melichar (1901), and Medler (1994) were used to verify the identifications. A specimen (Figs. 1–3) was photographed with a Canon Powershot SX530HS digital camera adapted to an Ample Scientific SMZT10 stereoscopic microscope. The map (Fig. 5) was developed with ArcGIS®.

Subfamily Flatinae Spinola, 1839

Tribe Selizini Melichar, 1923

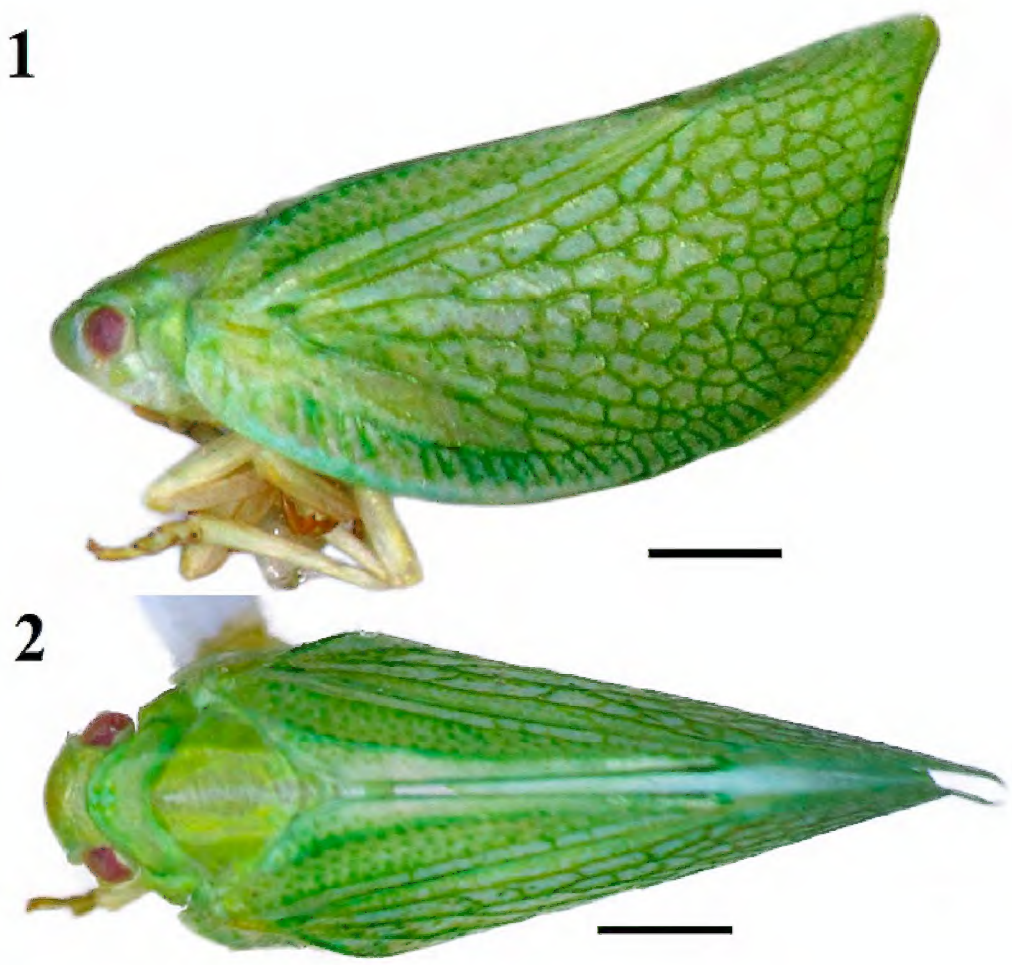
Genus ***Arelate*** Stål, 1862: Figures 1–3

Arelate Stål 1962: 313 — Melichar 1901: 255; 1923: 50; Metcalf 1957: 218; Medler 1988: 62

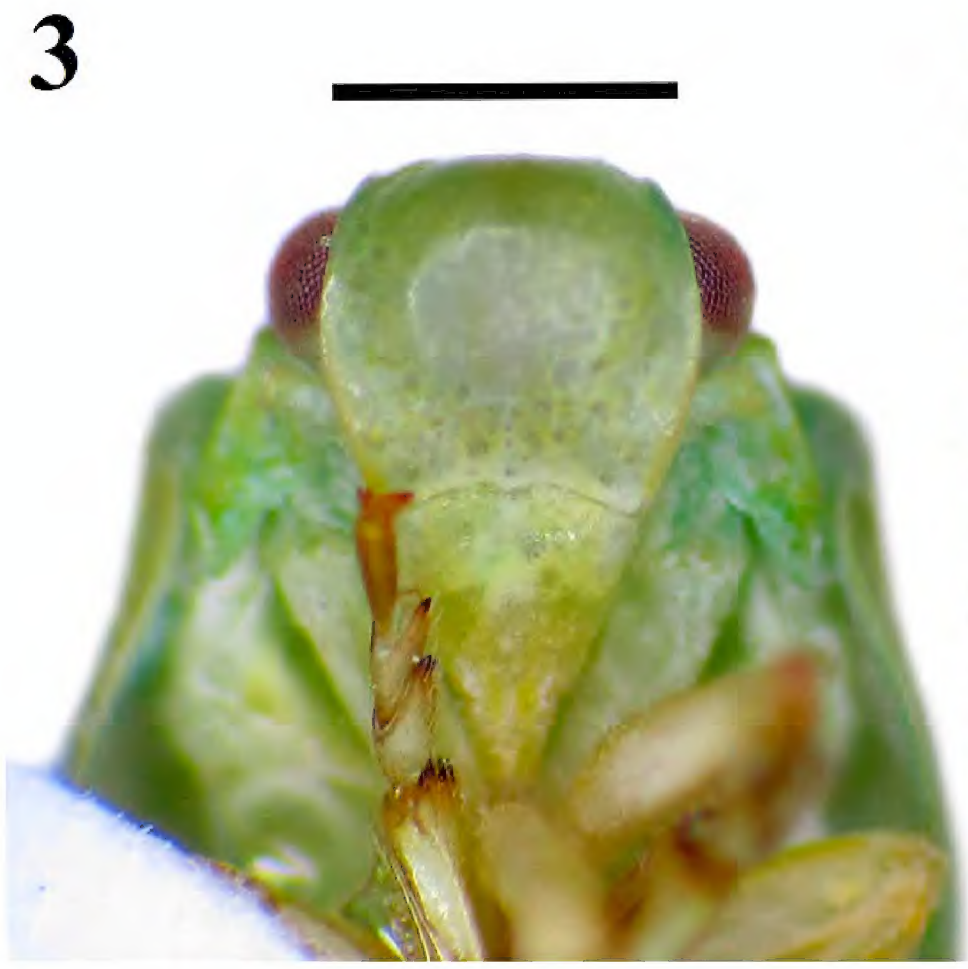
Type species. *Poeciloptera limbellata* Stål, 1854, by monotypy.

Diagnosis. Head (Figs. 1–3) short, anteriorly rounded, without carinae on disc of metope (Fig. 3). Pronotum (Fig. 2) convexly produced anteriorly; median carina inconspicuous. Mesonotum (Fig. 2) with 2 lateral carinae; median carina inconspicuous. Forewings (Fig. 1) with costal angle widely arcuate; sutural angle acute. Metatibiae with 1 lateral spine.

Note. Metcalf (1957) places the genus in the subtribe Lawanina Melichar, 1923 of the tribe Flatini Spinola, 1839 (following Melichar (1923)); however, Medler (1988) excluded *Arelate* from subtribe Lawanina, being its higher classification not subsequently treated.



Figures 1, 2. *Arelate limbellata*, male (Quilpué, fundo El Carmen, Valparaíso Region). **1.** Lateral view of the male. **2.** Dorsal view of male. Scale bars= 1 mm.



Figures 3, 4. 3. *Arelate limbellata*, male, ventrocranial view of head (Quilpué, fundo El Carmen, Valparaíso Region, Chile). **4.** *Chusquea cumingii* (Olmué, Valparaíso Region). Scale bar = 1 mm.

Arelate limbellata (Stål, 1854): Figures 1–3

Poeciloptera limbellata Stål 1854: 248

Arelate limbatella [sic] — Stål 1962: 314; Melichar 1901: 255; 1923: 50

Arelate limbellata — Medler 1993: 440; 1994: 222

Material examined. Chile: Valparaíso Region: Petorca Province: Fundo Talanquén, 6.XII.1984, M. Elgueta leg., 1♂ [#2017001] 1♀ [#2017002] (MNNC). Valparaíso Province: Mantagua, 22.XII.1973, L.E. Peña & L. Cartagena leg., 2♂ [#2017003, #2017004] (MEUC); Cuesta Zapata, 18.I.1971, J. Solervicens leg., 2♀ [#2017005, #2017006] (MNNC). Marga Marga Province: La Campana, 1000 m., 12.III.1979, J. Solervicens leg., Hygrophilous forest, 1♂ [#2017007] (MNNC); Olmué, 32°58′ S, 071°11′ W, 600 m., 13.XII.2014, J.F. Campodonico leg., On *Chusquea cumingii* Nees (Poaceae), 1♀ [#2017008] (JFCW); Quilpué, Fundo El Carmen, 33°02′ S, 071°27′ W, 100 m., 3.I.2014, J.F. Campodonico leg., 1♂ [#2017009] 1♀ [#2017010] (JFCW); Base Cuesta Colliguay, 12.II.1967, J. Solervicens leg., 2♀ [#2017011, #2017012] (MNNC). San Antonio Province: El Tabo, Quebrada de Córdova, 33°26′ S, 071°39′ W, 30 m., 10.XII.2016, J.F. Campodonico leg., On *Chusquea* sp. (Poaceae), 1♂ [#2017013] (JFCW). Metropolitan Region:

Table 1. Distribution records of *Arelate limbellata* in Chile.

No.	Region	Province	Locality	Latitude	Longitude	Biogeographical province†
1	Valparaíso	Petorca	Fundo Talanquén	32°27′ S*	71°14′ W*	Santiagan
2	Valparaíso	Valparaíso	Mantagua	32°54′ S*	71°29′ W*	Santiagan
3	Valparaíso	Valparaíso	Cuesta Zapata	33°22′ S*	71°26′ W*	Santiagan
4	Valparaíso	Marga Marga	La Campana	32°57′ S*	71°08′ W*	Santiagan
5	Valparaíso	Marga Marga	Olmué	32°58′ S	71°11′ W	Santiagan
6	Valparaíso	Marga Marga	Quilpué, Fundo el Carmen	33°02′ S	71°27′ W	Santiagan
7	Valparaíso	Marga Marga	Base cuesta Colliguay	33°10′ S*	71°08′ W*	Santiagan
8	Valparaíso	San Antonio	El Tabo, Quebrada de Córdova	33°26′ S	71°39′ W	Santiagan
9	Metropolitana	Santiago	El Arrayán	33°20′ S*	70°28′ W*	Santiagan
10	Metropolitana	Santiago	Quebrada de Macul	33°30′ S*	70°30′ W*	Santiagan
11	Metropolitana	Cordillera	Cajón del Maipo, La Obra	33°35′ S*	70°29′ W*	Santiagan
12	O`Higgins	Cachapoal	Doñihue, track to Poqui	34°10′ S	71°01′ W	Santiagan
13	O`Higgins	Cachapoal	Coya	34°12′ S*	71°31′ W*	Santiagan
14	O`Higgins	Cachapoal	Rengo, Hacienda las Nieves	34°28′ S*	70°44′ W*	Santiagan
15	Maule	Curicó	Los Queñes	34°59′ S	70°48′ W	Maule
16	Maule	Curicó	Potrero Grande	35°12′ S*	70°53′ W*	Maule
17	Maule	Linares	Rabones	35°50′ S*	71°19′ W*	Maule
18	Bío Bío	Ñuble	Bulnes	36°44′ S*	72°18′ W*	Santiagan
19	Araucanía	Malleco	16 km SE Curacautín	38°33′ S	71°44′ W	Maule
20	Los Ríos	Valdivia	Panguipulli, Puyumen	39°40′ S	72°17′ W	Valdivian Forest

*Only referential coordinates based on the locality given on the label.
†Following Morrone (2015).

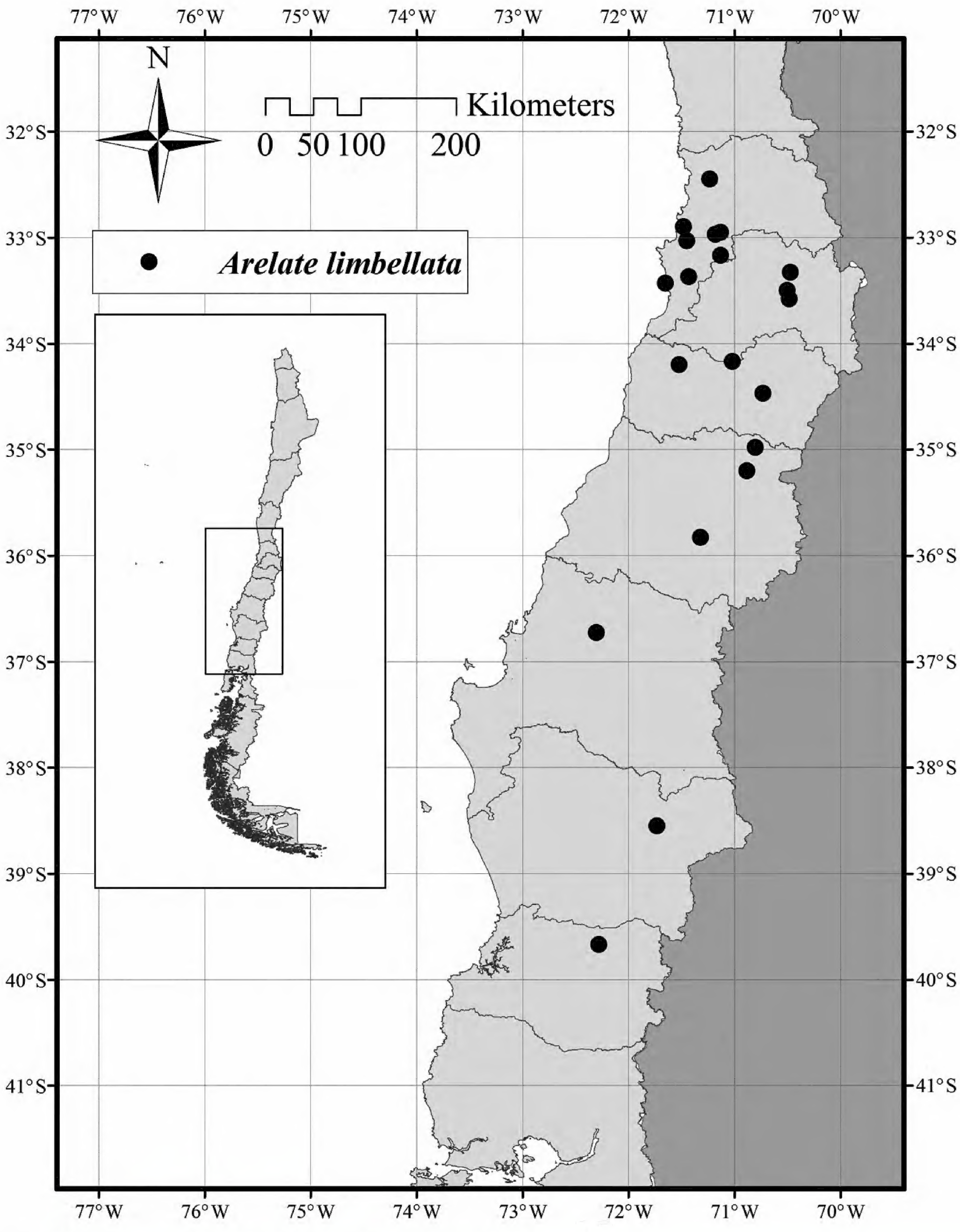


Figure 5. Distribution map of *Arelate limbellata* in Chile (geodetic datum: WGS84).

Santiago Province: El Arrayán, XI. 1985, Th. Fichet leg., 1♀ [#2017014] (MEUC); El Arrayán, I.2017, R. Pérez de Arce leg., 1♀ [#2017015] (JFCW); Quebrada de Macul, 1.III.1981, G. Arriagada leg., 1♂ [#2017016] (JFCW), 1♀ [#2017017] (MNNC). Cordillera Province: Cajon del Maipo, La Obra, 21. I. 1993, A. Lüer leg., 3♀ [#2017018, #2017019, #2017020] (JFCW); La Obra, I. 2017, R. Pérez de Arce leg., 1♀ [#2017021] (JFCW). O'Higgins Region: Cachapoal Province: Doñihue, Camino a Poqui por Los Bronces, 34°10′ S, 071°01′ W, 725 m, 15.XII.2014, J.F. Campodonico leg., On *Chusquea* sp. (Poaceae), 1♂ [#2017022] (JFCW); Coya, 10. V. 1993, R. Pérez de Arce leg., 1♀ [#2017023] (JFCW); Coya, 10. I. 2015, S. Roitman leg., 3♂ [#2017024, #2017025, #2017026] 3♀ [#2017027, #2017028, #2017029] (JFCW); Rengo, Hacienda Las Nieves, Río Claro, 1350 m., No date, L. Faundes leg., 1♂ [#2017030], 1♀ [#2017031] (MEUC). Maule Region: Curicó Province: Los Queñes, 34°59′ S, 070°48′ W, 800 m., 30.I.2016, A. Lüer leg., On *Chusquea* sp. (Poaceae), 4♂ [#2017032, #2017033, #2017034, #2017035], 6♀ [#2017036, #2017037, #2017038, #2017039, #2017040, #2017041] (JFCW); Potrero grande, 20.I.1992, J.E. Barriga leg., 1♂ [#2017042], 1♀ [#2017043] (MNNC). Linares Province: Rabones, 17-23. II. 1997. J. Moroni leg., 1♀ [#2017044] (JFCW). Bío Bío Region: Ñuble Province: Bulnes, 13. XII. 1991, C. Muñoz leg., 2♀ [#2017045, #2017046] (MNNC). Araucanía Region: Malleco Province: 16 km SE Curacautín, 38°33′ S, 071°44′ W, 900 m, 18–22.II.2015, R. Honour leg., 2♂ [#2017047, #2017048], 3♀ [#2017049, #2017050, #2017051] (CPRH). Los Ríos Region: Valdivia Province: Panguipulli, Puyumen, 39°40′ S, 072°17′ W, 200 m, 25.I.2014, J.F. Campodonico leg., 1♀ [#2017052] (JFCW).

Host associations. *Chusquea* spp. (Poaceae: Bambusoideae) (Fig. 5). Genus *Chusquea* Kunth is composed in Chile by at least 12 species. They thrive in temperate to cold climates between Valparaíso and Aisén regions (Pacheco 2013).

Seasonality. Aestival, adults were collected mainly between December and February, with a few specimens recorded on November and the first half of March.

Remarks. *A. limbellata* can be easily recognized from the other Chilean species of this family, *Poekilloptera aurantiaca* by external features like its smaller size (6–8 mm in *A. limbellata*, ca. 20 mm in *P. aurantiaca*) and the greenish color of well-preserved specimens (orange-yellow with dark spots on forewings in *P. aurantiaca*) (Figs. 1–3) (Stål 1854, Melichar 1901, 1923, Medler 1994).

This is the first contribution to determine the distribution range of *A. limbellata* in Chile. This species is endemic to Chile, and ranges from Valparaíso Region in the north to Los Ríos Region in the south (Fig. 4, Table 1) and occurs in a wide variety of habitats such as matorral, sclerophyll woodlands, hygrophilous forests and deciduous *Nothofagus* forests. This distribution comprises Santiagan and Maule biogeographical provinces, and reaches the northern part of the Valdivian Forest province (Morrone 2015, Table 1). Even though the 2 most northern records are not recent data, much of the range is supported by material collected during the last 10 years. Here, I also report the first host association with the genus *Chusquea* Kunth (Poaceae: Bambusoideae). However, monophagy is not assumed.

The distribution of *Poekilloptera aurantiaca* remains unknown, as no material has been recently collected. Therefore, additional data on Chilean Fulgoroidea are needed to clarify the distribution of this species. It is possible that *P. aurantiaca* is not a Chilean species, and the type material reported by Melichar (1901) was erroneously labelled. This possibility is reinforced by the fact that several other hemipterans have been recorded from "Chile" in the past but were actually collected in other South American countries (Faúndez 2007).

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